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ABSTRACT

Increasing collaboration between vocational education and the defense establishment has become a priority of the Federal Government in its efforts to meet national defense preparedness goals. As a result of a project to meet this priority need, this set of guidelines was developed for use in motivating and training individuals to develop and maintain effective linkages under various conditions. These guidelines are concerned not only with collaborative efforts between vocational education and defense industries, but also with linkages between vocational education and the armed forces. The guide contains 11 sections. The first section is an overview of the vocational education-defense sector relationship. It is followed in the next two sections by a discussion of the benefits of vocational education-defense collaboration and examples of collaborative efforts. The fourth section contains information on determining standards of program effectiveness, while the fifth and sixth sections discuss factors contributing to successful linkages and barriers to such linkages. In the seventh section, a systems approach to cooperative planning is presented; this is followed by a section on implementation processes and techniques and a section on a comprehensive evaluation system. The tenth section is a short summary of the collaboration guidelines, while the final section provides a list of references. (KC)

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GUIDELINES FOR INCREASING COLLABORATION BETWEEN VOCATIONAL EDUCATION AND THE DEFENSE ESTABLISHMENT

Donald M. Clark

U.S. DEPARTMENT OF EDUCATION
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FOREWORD

Increasing collaboration between vocational education and the defense establishment has become a priority of the federal government in its efforts to meet national defense preparedness goals. The current national concern for strengthening the defense establishment, i.e., all public and private agencies directly involved in defense preparedness, arises from projected shortages of skilled and technical workers which will prevent our defense industrial sector from effectively responding to a possible national defense emergency.

In response to this concern, the U.S. Department of Education, through the Office of Vocational and Adult Education, awarded a contract to the National Association for Industry-Education Cooperation to improve collaboration between vocational education and the defense establishment (the American Institutes for Research serves as a subcontractor). One of the major tasks of the project is to prepare guidelines for use in motivating and training individuals to develop and maintain effective linkages under various conditions.

These guidelines are concerned not only with collaborative efforts between vocational education and defense industries, but also with linkages between vocational education and the armed forces. The ultimate goal of this project is to foster vocational, industrial, military collaboration on training and related initiatives which is central to improving our nation's defense preparedness.

PREFACE

These guidelines were developed using all previous project task experiences and materials such as the: state-of-the practice report, standards for assessing exemplary linkages, and analysis of factors contributing to the development of exemplary linkages. Dr. Albert B. Chalupsky, Subcontractor Director and Marie R. Peirano-Dalldorf, Vocational Education Specialist at the American Institutes for Research, were most helpful in contributing to this document. Special recognition is also due to Dr. Richard J. McCowan, NAIEC Industry-Education Evaluation Specialist, for his work in editing the draft guidelines.

Additional information in preparing the guidelines was obtained from local and state vocational education and defense personnel, input from the Project Advisory Council and the ideas of practitioners involved in the exemplary vocational education/defense collaborative process through on-site interviews, correspondence and telephone discussions.

Each topic in the guidelines is described in sufficient detail to provide vocational educators and defense personnel at the state and substate levels with an understanding of the strategies and procedures in stimulating exemplary collaborative linkages between vocational education and the defense establishment, including detailed procedures for fostering joint efforts under varying conditions and constraints.

I. OVERVIEW OF THE VOCATIONAL EDUCATION-DEFENSE SECTOR RELATIONSHIP

A. The Framework for the Collaborative Process

Vocational education-defense establishment collaboration is part of the content and practice that is traditionally referred to as industry-education cooperation. Cooperative relationships between the two sectors have become a key concept of the 1980's, a period when scarce resources have fostered partnerships in achieving goals.

A number of studies by individuals, commissions, task forces, government agencies, foundations, and corporations have indicated that vocational education should increase and improve its involvement with the defense sector and the employment community in general. The point of intersection between the worlds of vocational education and industry is human capital formation -- educating and training skilled workers for the future -- and the intent of the collaborative effort is to improve the education-to-work process.

While cooperation between vocational education and the defense establishment has taken place in the past, and continues to do so, this involvement has often been conducted on a fragmented, uncoordinated, duplicative, and ad hoc basis. Joint efforts in program planning, implementation, and evaluation, although a primary goal of both vocational education and the defense sector, are lacking, for the most part, in any formal manner.

Both defense representatives and vocational educators must familiarize themselves with each others system, organizational structure, governance, its finances, and how the vocational program fits into the overall defense contractor and armed forces system? Defense representatives working with the vocational education community expect to be asked to deal with substantive issues. They also expect to receive suggestions and participate in the design and delivery of occupational programs including:

* Examination of instructional content.
* Assessment of instructional activities or methods.
* Review of facilities, equipment, and materials for instruction.
* Examination of program costs and expenditures.
* Review of opportunities for inservice of instructional staff.
* Identification of supplemental education needs of clients.
* Examination of ancillary or support service and vocationally oriented guidance.

These substantive issues should be presented as a context for involving the defense sector in vocational education program planning, implementation and evaluation.

A closer examination of the collaborative process between vocational education and the defense establishment highlights the need for active participation by all members of the partnership and a continuous integration of effort toward common goals with shared authority and

responsibility. Under a fully collaborative arrangement, vocational education and the defense industry share in authority for what must be done, and be held equally responsible for the outcomes. Thus, it can be distinguished from other ventures where some of the participants perform quite passively, usually by lending or giving in-kind resources and providing financial support.

In establishing the framework for increasing collaboration between vocational education and the defense establishment, the following are central to the discussion:

* Vocational education-defense establishment collaboration should be viewed as part of a much larger dimension of industry-education cooperation, or more appropriately perhaps, employer-education cooperation. The greater this overall cooperation the more likely it will be that vocational education's relationship with the defense establishment will flourish. On a very practical level, most businesses are, or could well be, defense contractors, subcontractors, or vendors at one time or another. Suppliers particularly may work on defense business one day and nondefense business the next.

* Defense preparations are not independent of other urgent concerns impacting on skilled labor. Many of the same types of efforts that aim, say, at stimulating economic development or enhancing industrial productivity can also be applied to enhance vocational education collaboration with the defense establishment.

* Both the immediate and long-term results of improved collaboration should be viewed in a broader light of overall mutual benefits to both vocational education and to the defense establishment - not solely in terms of improved defense preparedness. Schools need to benefit directly and vocational educators need to feel that the schools can benefit if there is to be any chance of overcoming the lack of urgency that has been reported. Anything that helps either party in this collaboration helps the entire program.

* Regardless of who initiates the efforts to expand cooperation between vocational education and defense-related agencies, at the earliest time the local school agencies and the local businesses must be brought together. Federal and state agencies could help increase this cooperation with significant benefits to economic development and to defense preparedness at relatively modest cost.

B. The Basis for and State-of-the Art in Vocational Education/Defense Collaboration

Engaging in collaborative arrangements presumes that there are some underlying reasons as to why vocational education and the defense industry find such arrangements necessary. In vocational education, collaborative activities are justified on the basis of the following:

* With decades of training experience behind them, vocational educators point to their expertise and an educational infrastructure designed to deliver training that enables them to perform in joint efforts with employers.

* The rapidity of technological innovation and the attendant increase in skill requirements makes linkages with the defense sector and other employers critical if vocational educators are to stay current on technological developments.

* Other reasons include: the potential for securing resources from the defense industry in an era of scarce public funds; the potential to contribute to defense preparedness by designing training programs and expanding services needed for strengthening the capabilities of the civilian and military labor force where appropriate; improving productivity; contributing to economic development; and the need for the defense establishment to help solve problems experienced in vocational education.

The case for collaboration is based on the premise that vocational education has an in-place training system, and that linkage and cooperation is necessary to ensure that the system continues to be effective in making contributions to the defense sector and to industry in general.

The defense industry, on the other hand, has a somewhat different but complementary set of reasons for participating in collaborative process. Its major priority is the need for a competent, skilled/technical and committed work force to strengthen the nation's defense industrial and military capability and to use its capital investment and modern technology in the most cost effective manner. At the same time, the defense community recognizes its role in fostering school improvement and economic development through collaboration with vocational education.

The nature of the vocational education/defense collaboration can be viewed in terms of a continuum where at one end are programs in which there is nearly total separation between the schools and the workplace, and the education system operates without any contact with the employment community. At the other end is the highest degree of collaboration represented by an integration of defense industry-vocational education resources in which one unified system conducts a training program.

There are very few instances where vocational institutions do not interact with employers. Whether vocational education is in a secondary or postsecondary, private or public, rural or urban setting, almost all institutions involve employers in some way -- if only on vocational advisory committees.

At the next linkage level, <u>communication</u>, vocational institutions and the defense community seek to open dialogue and an effective exchange of information, e.g., through vocational advisory committees for the

purpose of assessing training needs and curricular content among other things.

Moving toward the participation level involves joint planning and tailored training, programming, use of industry volunteer resources - personnel, facilities, materials and equipment - staff-industry exchange programs, and a variety of other collaborative practices.

Integration represents the ultimate linkage between vocational education and the defense establishment in which a joint sphere of authority exists to accomplish mutual objectives; resources are merged in a manner that will most effectively accomplish this objective; and there is responsibility for the success or failure in accomplishing this objective.

The vocational education-defense collaborative effort, in the aggregate, fits into the middle of the continuum at this time, which does not provide the level of coherent action required to cope effectively with work force requirements of the defense sector in the short and long term. Moving toward the upper end of the continuum, therefore, is central to improving defense preparedness.

II. THE BENEFITS OF VOCATIONAL EDUCATION-DEFENSE COLLABORATION

A. Benefits to Education and Employers

Central to the establishment of exemplary vocational education/defense linkages is the recognition of benefits to be gained by these cooperative arrangements. Based on the review of the literature and contacts with personnel active in these collaborative efforts, it is clear that vocational education and the defense community benefit in every type of linkage activity studied.

In North Carolina, the State Department of Education and the Department of the Army have developed a joint electronics training action project in which public school vocational teachers are participating in state-of-the art training in electronics. The teachers have returned to their classrooms and provided their students with updated information and the skills training which results in placing qualified students in the electronics industry, including defense contractors in the Raleigh area.

Ft. Gordon staff conducting this inservice training program have provided public schools with instructional materials and surplus electronic materials and supplies for use in the vocational programs. In return, they have used instructional materials developed by the public schools in their regular programs.

In Columbus, Ohio, Rockwell International has significantly expanded its training program to meet employment needs resulting from a contract for the B-1 bomber in cooperation with area vocational institutions. During the 1985 spring semester, this training program will be conducted using school facilities with Rockwell loaning the required equipment and providing all materials.

The company will identify potential employees focusing on unemployed individuals. The trainers for the course will be vocational education teachers who complete an inservice training program at Rockwell.

Vocational educators have direct, active contact with a sophisticated, high quality industrial training operation and are able to utilize and build upon the expensive planning and development activities supported by Rockwell. The collaborative effort with area vocational institutions is providing this defense contractor with well-trained new employees who have the skills to produce high quality products efficiently resulting in savings through lower production costs.

Many other benefits can accrue directly to schools from their cooperative efforts with employers, including:

* technical assistance in curriculum development,

* additional job opportunities for graduates,

* opportunities for instructional-staff development,

* increased education awareness of the business point of view,

* assistance in identifying and building support for educational objectives,

* improvement of school operations efficiency through business management techniques,

* additional funds received,

* increased student understanding of how basic skills are used in business,

* upgrading of equipment and facilities, and

* enhancing the prospects for developing new programs and improving current programs.

B. Benefits to Business and Government Employers

While it is very possible that employers can benefit in many different ways from collaborative programs with vocational education; for example, in improved public relations and community image, their primary objective is to expand their skilled labor supply and to improve its quality in a cost-effective manner. Even employers whose sole goal is to increase profits can see that their ability to be more selective within a higher quality applicant pool can have a very direct impact on their productive efficiency.

When one examines improving the quantity and quality of the labor force in a timely and efficient manner as the overall goal, some of the near-term or intermediate benefits of improved vocational education-defense establishment collaboration include:

* improved understanding of business products, services, and policies,

* increased number of qualified job applicants,

* improved quality of new employees,

* reduced time to train new employees,

* lower training costs, and

* increased tenure of high quality employees.

C. Benefits to the Military

With over 500,000 new military personnel recruited each year, coupled with the vast numbers of current military needing job training, the potential for collaborative efforts with vocational education are virtually limitless. Some potential benefits are as follows:

* enlarging the number of 17 - 21 year-olds who are enlistable,
* increasing occupational knowledge,
* developing lateral-entry programs,
* providing surge-training capacity, and
* assisting in reservist training.

III. EXAMPLES OF COLLABORATIVE EFFORTS

There are obviously many different ways to categorize collaborative efforts between vocational education and industry (or government). However, in line with the project goal of helping to expand the number of effective, collaborative programs between vocational education and the defense establishment, it seems most appropriate to focus on the strategies used. Accordingly, this section of the report categorizes such programs into seven different patterns of collaboration, and provides examples of each:

* Employer representatives as school advisors,
* Job-training programs for employers,
* Loans or gifts of equipment to schools,
* Employer representatives as trainers,
* Brokering of educational services,
* Small business linkages, and
* Training material repositories.

* Employer Representatives as School Advisors

The National Advisory Council for Vocational Education estimates that there are over 300,000 employers, employees, and labor leaders serving on general and craft advisory committees. The very pervasiveness of this collaboration pattern suggests that merely having an employer advisory committee says nothing about the extent or real value of the committee; the key is how such a committee functions and how it impacts on the training program. The American Electronics Association (AEA) has recognized the need for a mechanism to streamline and update curricula, and through an industry committee has created a guidebook that identifies core curriculum topics and objectives for four electronics technician courses and is used by community college instructors and company trainers for creating and updating the courses.

The importance of effective advisory committes has been recognized in the new vocational education law, the Carl D. Perkins Vocational Education Act. One provision of the Act requires that a majority of the state council members be drawn from business and that these business leaders help develop plans for spending the federal funds. Another provision of the new law requires state boards of education to establish technical committees composed of business and labor leaders in order to develop information on the skills and competencies needed to enter and progress in several occupational areas.

* Job Training Programs for Employers

The development and implementation of customized training services for business and government agencies occur over and over again, across the entire country. Perhaps because they occur so often, they attract little attention, and yet there is no doubt that the nation would benefit from more high quality programs in this area. While the size and the characteristics of such programs vary immensely in the extent of employer involvement in program planning, they often involve employers working with instructors to design a single course or a multi-course program to meet the specific needs of one or more employers.

Defense industry. An illustration of one of these cooperative efforts with employers was the development in the late 1970s of a two-year Electronics Design option to the Drafting and Design Associate Degree Program at Eastfield College, part of the Dallas County Community College District in Texas. Texas Instruments (TI) was one of the Dallas County employers that provided the leadership for this new degree and continues to work on a close basis with school personnel. Full-time employees of TI are placed in the Eastfield program as full-time students for the first semester, with educational costs reimbursed by TI (providing the trainees make a grade of C or better). After the first semester, students are assigned to a regular shift for on-the-job training and further classroom instruction, with pay increases geared directly to their college success.

Another major consortium is the recently formed Southern California Aerospace Industry-Education Council. This cooperative effort, involving McDonnell Douglas, Northrop, Rockwell International, Hughes Helicopters, and a number of community colleges, is directed toward expanding the aerospace manufacturing skills base in Southern California. An initial effort was the identification of generic job areas and the development of common job descriptions in aerospace manufacturing. Other council objectives include curriculum development, the supporting of key legislation, and the development of media pointing out the career opportunities in aerospace manufacturing.

Mississippi junior and community colleges utilize state funds to provide start-up training programs tailored specifically to meet industry's training needs. A memorandum of understanding was developed with industry, outlining what resources will be provided by the junior college, industry, and the Mississippi State Department of Education. Technical assistance is sought from Mississippi State University to help design the program and develop the curriculum. This assures that industry is not tied down to using a curriculum that was not developed specifically for their operation. Success of this start-up training can be attributed to the rapid mobilization of state resources and the flexibility of the program so that industry is not hampered by red tape.

Federal government. An example of a large-scale collaborative effort between the federal government and vocational education is the program involving Tinker Air Force Base in Oklahoma City and the Oklahoma State Department of Vocational and Technical Education. The state had provided training courses for Tinker employees since 1967; however, in 1979 a unique agreement was reached between the Air Force base and the state to establish the Tinker Vo-tech Training Center in a warehouse building located on the base. Remodeling of the building interior was the responsibility of the State Vo-tech Department, with a heavy involvement of students from the area vo-tech schools. All standard training equipment was furnished by the state, while Tinker supplied the specialized aircraft-related equipment. From the standpoint of operating costs, the state supports the administration of the center while income from Tinker supports the training costs, which amount to about 75% of the total budget.

The military. Providing instructional programs for military personnel is not well known but is, nevertheless, an important service being provided by postsecondary institutions. For nearly 15 years, the Naval Air Technical Training Center has contracted with the State Technical Institute at Memphis (STIM) to teach basic electricity and electronics, job-oriented basic skills, and aviation fundamentals, as well as share the training delivery for other courses, including advanced technical subjects. In addition to the Memphis site, the Navy is using four other community colleges that are adjacent to its training sites to provide similar services.

* Loans or Gifts of Equipment to Schools

Since 1974 nearly 300,000 students have graduated from programs that have received loans of plant equipment under the Defense Department's "Tools for Schools" Program, while at the present time some 52 million dollars of equipment is being used by 83,000 students under this program. On a more modest level, the American Electronics Association has piloted an "Equipment Bank" in which electronics companies were provided a list of items needed by community colleges in the area. Companies responded but they had to be challenged to provide equipment that schools need rather than merely giving away their discards.

* Employer Representatives as Trainers

Another pattern of collaboration between vocational education (especially at the post-secondary level) and the defense establishment that is so common it is virtually ignored. This is especially true of the numbers of defense industry employees who "moonlight" by teaching night classes on college campuses. The American Electronics Association, in recognition of the continuing need for instructors with state-of-the art expertise, provided an opportunity for a college electronics instructor to spend his sabbatical developing a resource list of industry employees interested in teaching in local community colleges. Over 250 technicians and engineers were identified in the San Francisco Bay area; however, in the fall of 1983, only a few colleges had tapped this resource.

Two more formal examples in this area are the Computer Aided Design/ Computer Aided Manufacturing (CAD/CAM) and Computer Numerical Control (CNC) Machining at the Los Angeles Employment Training Panel Center, linking education and aerospace companies. The CAD/CAM program utilizes technical instructors from participating employers to provide the classroom training while the CNC program provides training in a mobile trailer, and technical employers participate as instructors.

* Brokering of Educational Services

The Technology Exchange Center (TEC) in Southern California uses a unique brokerage technique to link industry's technical training needs to the vocational education system. TEC serves as a broker to:

* coordinate training resources from a sizable number of community colleges to meet needs resulting from emerging technology or new industry;

* deliver trained workers for hire when needed by employers;

* determine pockets of excess labor and coordinate exchange; and

* upgrade or retrain groups of workers from companies, reducing costs to companies while increasing employment force.

TEC brokers training to the local community college and leverages additional training from education to industry. This training may include lectures, workshops, plant tours, etc. Since about one-third of all technical jobs in the Orange County area are in the defense industrial base, the brokerage technique has had definite impact on defense preparedness.

With this brokerage process, TEC has also been able to assist the educational institutions in their planning process by projecting curriculum needs and improving upon the relevancy of their curriculum.

* Programs for Small Businesses

Because the small subcontractor or vendor was singled out by Congress as a particularly weak link should a sudden national emergency occur, there has been an effort to identify exemplary linkages between such firms and vocational education. Unfortunately, the search has produced few results. This lack of collaboration is illustrated in a recent survey of California employers which showed nearly half of the small firms in the study indicated that they were willing to work with schools but had not been asked. This relatively untapped area would appear to be a major opportunity for vocational educators. Further, a Department of Commerce study has shown that small businesses are a vital segment of the economy, employing nearly half of the nation's work force and providing some 86% of the new jobs in the private sector.

A truly unique example of a collaborative effort between small business, a government agency, and vocational education was found in Oklahoma. Here, thanks to the initiative of the director of the Small and Disadvantaged Business Utilization Office of the Oklahoma City Air Logistics

Center, a continuing series of small business contracting workshops has been presented since 1982. The workshops are presented by representatives of Tinker Air Force Base but are co-sponsored by the Oklahoma Department of Vocational and Technical Education. The workshops are aimed at providing small business with the information necessary for an intelligent decision as to whether or not to seek government contracts and if the decision is positive, how to locate the right marketplace, and submit proposals. Also covered in the workshop are the administrative actions to take after contract award.

* Training Materials Repositories

The National Center for Research in Vocational Education (NCRVE) makes available military curriculum materials to vocational and technical educators. These materials can be adapted for civilian programs or serve as resources. According to information obtained from NCRVE, requests range anywhere from 100-150 yearly since 1978. These requests come from a variety of agencies and seem to be heavily weighted toward community colleges and technical schools; but also include corporations and a mix of other requestors.

Over 150 courses are available through ERIC and over 30 vocational education resource centers have partial collections that are loaned to users; thus, the actual number of users per year may well be considerably greater than the 100-150 requests received directly by NCRVE.

For the most part, the military curriculum materials are used in the following manner:

1. Resources for curriculum development
2. Inclusion as parts of courses
3. Guidance for instructors
4. Adoption of complete courses as received

At present, there are some 1,400 courses on the NCRVE computerized data-base that are identified, acquired, evaluated, processed, and disseminated to educators (National Center for Research in Vocational Education, n.d.).

In addition to the NCRVE repository, the Aerospace Education Foundation, for the past 12 years, has been involved in the nonprofit sale and distribution of Air Force technical courses to more than 1,000 civilian educational systems in all 50 states. This program has fulfilled an urgent need for well-developed courses among the growing number of community colleges, helped establish credibility for the Community College of the Air Force, and allowed taxpayers' defense dollars to serve double duty. Purchasers of these materials are reported to be well satisfied with the Air Force materials because they are a considerable time and money saver. Follow-ups conducted by NCRVE to determine user satisfaction have indicated that the materials were "interesting, well-organized, and easily adaptable to own curriculum needs." These materials contain highly visual course content with a self-paced structure. This foundation is supported by aerospace corporations in America.

IV. DETERMINING STANDARDS OF PROGRAM EFFECTIVENESS

Judging the effectiveness of a collaborative effort between vocational education and the defense establishment can be achieved through a set of standards or criteria. If a program achieves only one of these standards or criteria, it can be considered a success - or at least more successful than had it not achieved the standard -- providing that no negative program effects overshadow this positive outcome.

A. Some Intermediate Standards of Program Effectiveness

One needs to realize that a standard, as good as it sounds, will not necessarily be appropriate for every program. With this in mind, a preliminary list of intermediate standards has been developed for further study. They are labeled "intermediate" because they are felt to be reasonably predictive of ultimate program success, but at the same time, worthy of achievement in their own right. Also, they should not require more than a year or two of program operation before the information can be collected. These proposed standards are listed below in no particular order:

* number of trainees placed on the job;
* number of graduates retaining their jobs for some specified period, for example, six months;
* an increase in the number of truly integrated vocational education-industrial training programs;
* evidence of effective use of combined resources of industry and education in such programs as internships, work experience programs, summer jobs for teachers, etc.;
* decreased costs of defense establishment training through increased utilization of instructors, training equipment, and/or materials from vocational education institutions;
* improved quality of vocational education programs as a function of greater involvement of technical experts from business and industry.

B. Some Proposed Near-Term Standards

Like those covered in the previous section, the standards listed below are judged to be worthy of achievement in their own right. However, for these near-term or immediate standards, we cannot be quite as certain as we were in the case of the intermediate standards that achieving these standards guarantees that the overall program will ultimately be successful. On the other hand, one definite advantage is that the standards listed below should be capable of being applied to a program rather early in its lifetime:

* number of companies assisted,

* number of individuals trained,

* evidence of an increased number of vocational education programs designed or modified to reflect the needs of the defense establishment,

* reduction in the time needed for a training program to become operational,

* reduced time to train new employees of the defense establishment,

* evidence of effective use of industry-developed training materials in vocational education programs,

* evidence of effective use of industrial trainers in vocational education programs, and

* use of vocational education instructors and materials in industrial training programs.

It is apparent from this listing of standards, both the near-term standards of this section as well as the intermediate standards covered in the previous section, that some are much easier to quantify or measure objectively than are others. Certainly, one seeks to strive for objective measurement wherever possible, but one should be careful not to fall into the trap of assuming that the more quantifiable a standard is, the more valid it is. We should expect that judgment will play an important part in all standards development and application.

V. FACTORS CONTRIBUTING TO SUCCESSFUL LINKAGES

The term "factors" refers to characteristics that appear to contribute to the successfulness of a program. A factor does not, in and of itself, define success and its presence in a program does not mean that a program is, therefore, a sucess. On the other hand, the identification of such factors is very important in terms of searching for program characteristics that should be included in a new program to increase its likelihood of success. The more we know about the factors associated with success the greater our chances will be to design exemplary, collaborative programs.

The concept of vocational education/defense collaboration is relatively simple and appealing, but the practice of initiating and sustaining cooperative arrangements is complex. However, there are a number of key factors that are common and successful to a broad base of industry-education joint efforts.

A. Items to Exchange - A fundamental condition for establishing industry-education cooperation is a basis for exchange. Each participant in the partnership has exchangeable items to contribute to the cooperative relationship. And this, of course, is the situation in vocational education/defense collaboration.

On the one hand, vocational education can generally provide a well trained work force; and on the other, the defense industry furnishes the financial, physical and human resources to make the training possible.

B. Mutuality of Benefit - The presence of exchangeable items assures that each participant in the relationship has something to benefit from collaboration. However, joint efforts are strengthened only when each sector perceives mutual benefit or advantages from the partnership. The exchange must be a mutually balanced one, and the items exchanged must be sufficiently valuable to the participating organizations.

In the industry-education relationship, the schools, employer, and the student benefit from a partnership. The employment sector benefits from productivity and profitability because of a skilled and technical work force; the student receives better training and job opportunities, and education programs can maintain higher standards.

C. Complementary or Similar Characteristics - Collaboration between education and industry must be examined in terms of the dimensions of similarity and complementarity. The end purposes of education and industry are not similar. Yet, the goals are complementary since the individuals that complete their education program are utilized by industry to produce goods and deliver services. The complementary nature of goals make the relationship between the two sectors mutually supportive. If similar values, perceptions, expectations, and structures exist, the opportunities for increasing collaboration are significant.

In spite of the similar and complementary attributes that exist in education and the employment community, certain traditional differences can inhibit the collaborative process. These dissimilarities, e.g., different patterns of decision making and budget cycles, can become significant problems in fostering cooperation. They do not make the establishment of a partnership impossible. Rather, the differences that exist must be recognized and accommodated in developing and expanding exemplary vocational education/defense linkages.

D. Mutuality of Respect, Confidence, Trust and Commitment - Exemplary linkages cannot result without the qualities of mutual respect, confidence and trust between the education and employment communities. Only when industry is convinced that the education system is willing and capable of delivering training programs tailored to its needs, will it make the extra effort to assist the system with their personnel, materials, equipment and facilities. From mutual respect, confidence, and trust -- commitment to broaden the collaborative effort -- develops, a characteristic common to all exemplary linkage efforts.

E. Interorganizational Awareness and Communication - Central to the success of the collaborative process is the degree to which industry and education are familiar with each others goals and services; or more specifically, the extent to which each party is knowledgeable of the potential of the other organization to support its activities.

More effective communication is most important to fostering interorganizational awareness. Ineffective communication between industry and education has resulted in misunderstanding, myths, and stereotypes.

F. Flexibility/Response to Change - The collaborative process between education and employers requires, at times, intraorganizational adjustments. Additional responsibilities may have to be assigned, priorities may have to change so that resources can be reallocated; and sometimes, procedures may have to change; hence, flexibility is required.

Those sites where exemplary linkages exist between industry and education reflect flexibility in satisfying client needs without the tangles of red tape or the hassle of bureaucratic tie-ups.

Vocational education programs, for example, are subject to rules and regulations as are all government programs supported by tax dollars. As such, flexibility does not imply complete freedom from rules and regulations. However, within the limitations prescribed by federal, state or local laws, most successful vocational educators recognize the urgency of meeting the defense client needs and exercise a certain amount of flexibility to commit or expand available resources.

G. Preplanning a Collaborative Effort - Before a partnership becomes operational, some prior consideration must be given to implementing the linkage. Preplanning is necessary to insure that both educators and employers agree on the expected outcome to be derived from a joint effort and to insure that what is being proposed can be done effectively working together.

Exemplary linkage programs take into account: careful and thorough planning of each cooperative activity; a clearly written agreement or contract to help achieve successful completion of a joint project, and arrangement for ongoing evaluation.

H. Leadership - Strong and dedicated leadership is required to establish and maintain effective linkage between industry and education. Vocational education must provide the leadership in developing exemplary linkages with the defense industry in order to undertake joint training programs.

From these factors that are inherent in successful industry-education cooperation, in general, attention is focused, at this point, on the specific factors that are related to exemplary collaborative efforts between vocational education and the defense establishment:

* A formal policy statement; detailed, written policies and procedures, binding agreements between vocational education and defense industries and agencies, and written endorsements.

* Clear recognition that providing training services to employers is actually serving individuals (their clients) and thereby fulfilling the mission of vocational education.

* Recognition on the part of state legislatures and governors that vocational education has a definite role to play in economic development, which in turn can contribute to defense preparedness. This recognition should be supported by funds specifically earmarked for such purposes so that the more traditional programs of vocational education would not suffer financially by increased efforts devoted to industry-education collaboration.

* Special emphasis on determining the common needs of business and vocational education.

* Openness of communication and serious attempt to understand each other's position.

* Realistic commitments made by vocational education to employers (promising only what can be delivered).

* Single point of contact for assistance.

* A marketing plan developed and updated periodically.

* Staff members actually engaged in promotion and sales.

VI. LINKAGE BARRIERS AND PROBLEMS

Effective and efficient designs for increasing collaboration between vocational education and the defense sector must take into account the complex and sometimes hidden phenomena that cause problems.

There are some fundamental differences between the profit-oriented, short-term goals of industry and the longer-range perspective of the nonprofit educational organizations leading to a lack of cooperation and a low mutual regard for each other.

Because of its track record, the public education system is viewed by industry as being unable to meet the high demand for technical personnel that faces our nation. School administrators, at times, view industry as very narrow-minded, concerned only with immediate profit goals. If schools could create employer-based skills training programs to more sharply focus on the needs and demands of specific employers, this would help employers reduce the costs associated with developing and maintaining their own expensive programs. However, there are certain to be obstacles and barriers that will need to be overcome in order to match the public educational system's output with industry's need for skilled labor.

A. General Barriers

The following are general barriers that might be present with any type of collaborative effort between education and industry or between education and the various elements of the defense establishment:

1. Inability to resolve inherent differences and varying expectations - Education and industry are distinct bureaucracies with a very different set of structures and modes of behavior that have developed over several decades. Each sector has its own pattern of decision making and assumptions and expectations about the outcomes of a collaborative effort. To the extent that major differences continue to exist, particularly in the area of expectations and in the perceptions of partnership roles, cooperation and coordination in initiating or increasing a response to the skill needs of industry will be significantly affected.

   More specifically, the result will be a mismatch of short-term goals vs. long-term goals and "top down" vs. "bottom up" management relative to the two decision making structures, creating differences in policies, procedures, and objectives;

2. Lack of a unified effort - The state-of-the practice in partnerships in education/industry-education cooperation/all linkage arrangements is fragmented, uncoordinated, and duplicative and conducted on an ad hoc basis. This condition has significantly diminished the impact of industry-education cooperation at the local and state levels resulting in a lack of direction on the part of both entities in coordinated planning and the establishment of scope and objectives.

3. Tendency to maintain existing structures - There is, on occasion, a strong tendency among educators and industry personnel to hold fast to traditional structures and processes. It is the differences in structures and perceptions that help to maintain a gap between education and employers. If there is a built-in resistance to change within the education sector and a similar resistance among representatives from industry, then the perceived inappropriateness of existing structures will only function to thwart a collaborative process.

4. Corporate and institutional policies - It is equally necessary for any organization to establish policies and procedures regarding personnel, functions, and activities. Given the characteristics of human diversity and organization theory, the tendency for policies to become more detailed and rigid increases with the size and complexity of the organization. The entrenchment of such rigidities is likely to stifle creative ideas for collaboration.

   Some corporations require chain-of-command approvals for individual participation in formal external activities that may possibly involve corporate positions. There are educational institutions that require similar approvals for individual contacts with certain industries. More common problems arise from policies that relate to hiring and master contracts with unions, or site visits and proprietary technical development information. It is necessary and possible to show that certain policies can be waived on the basis of a greater mutual benefit that results from a joint project.

5. Maintaining the collaborative process over the long term - Many joint efforts between industry and education are not developed for the long term. The changing roles and responsibilities inside both the education and the employment community work against the continuity that is essential for formalized and lengthy collaboration. Some of the factors contributing to this situation include promotion and reassignment of personnel, single source funding, and the continuous reorganization of administrative units. This institutional flux inhibits continuity and establishing exemplary linkages.

6. Lack of training in industry-education cooperation - The collaborative process is a complex undertaking requiring specific skills and a significant effort to achieve productive linkages. However, there is little available training to prepare industry and education representatives to engage in cooperative projects. This lack probably stems from the misperceptions in both sectors that the process is automatic and does not require significant effort or training.

7. Semantic and other communication barriers - It is well known that semantics can defer, side track, or negate an exemplary cooperative project. Many terms such as training, communications,

accountability, responsibility and coordination, have different meanings in industry and education. In addition, there are individuals in both sectors whose personal use of terms creates confusion in interpretation. Further, there exists in a number of situations a lack of communication channels, or limited communication occurring only at top levels with no coordinated internal dissemination effort between those who are specifically involved in the activities.

8. Interpersonal factors - Personality conflicts, hidden agendas, and individual motivations often cause problems in the collaborative process. A relatively weak understanding of group dynamics and an insensitivity to personal needs can also hinder industry-education cooperation. Vocational educators and those in the defense community must be aware of the potential for such barriers to prevent productive linkages.

9. Neglecting management principles - Good management principles are needed in establishing and maintaining industry-education collaboration. Inadequate attention to the components of evaluation, communication of expectations, leadership, and the setting of goals and objectives can lead to barriers for effective cooperation and coordination.

Other barriers inhibiting industry-education collaboration have been identified as follows:

* schools moving slowly in areas of creating new programs and courses, or in hiring full-time faculty while industry moves rapidly in personnel and policy changes;

* inability of educational institutions as stable institutions with long-term plans to deal with industry's short-term predictions on manpower needs;

* lack of flexibility to offer courses at times that differ from the traditional academic calendar and for shorter periods (few days, weeks, or months) of time;

* schools receiving sporadic company support;

* difficulty in coping with programs that are fashioned and specifically tailored to a particular company's requirements;

* company equipment being damaged by student use;

* possibility of trade secrets being exposed;

* instability in corporate personnel because of rapid turnover rate;

* product lines or working groups appearing and disappearing causing discontinuities and lack of commitment;

* lack of agreement on research planning;

* different funding cycles;

* criticism by industry of community colleges' rigid credentialing of appropriate instructors;

* feelings of community colleges that company-based instructors are too narrow-minded;

* no contract of agreement as to exactly what each entity would be responsible for accomplishing.

B. Barriers Inhibiting Collaboration Between Education and the Military

Listed below are the major barriers that are counterproductive to effective collaboration between education and the military:

* vocational educators having a limited understanding of the military difficulty in relinquishing ownership of their training programs so as to encourage a closer cooperative relationship with vocational training institutions;

* the need to develop an efficient method whereby the military can evaluate the compatibility of vocational training programs;

* preconceived ideas reflecting concern that the public educational system is engaged in quasi-military training;

* the apprehension that the public education system will be co-opted by the military if the military commits substantial resources to external training;

* the mismatch of the two decision making structures;

* misconceptions of military personnel about civilians lacking specialization to teach while military is viewed by vocational education as not employing vocational graduates in tasks that challenge their training;

* the idea of developing trained personnel for "export," since military personnel tend not to stay in the community;

* the military's apprehension that it will lose its full control over military training.

VII. COOPERATIVE PLANNING AND ORGANIZATIONAL CONSIDERATIONS: A SYSTEMS APPROACH

Creating an effective local and state infrastructure for exemplary vocational education/defense community linkages is a long term, incremental process. There are no identifiable realistic short term alternatives to building a base for a comprehensive alliance between the two sectors.

Patience, thorough planning and evaluation, intensity of effort, and adequate resources are required in developing and implementing joint training programs. A coherent vocational education/defense establishment alliance will require a cost-effective structure and process in which goals are clearly defined, beneficiaries accurately targeted, and employers actively involved.

The collaborative process consists of the following components: planning, organization, implementation and evaluation. Strategies for each of these components are applicable to the previously cited types of on-going model vocational education/defense programs described in Section III.

A. The Planning Function

A great amount of planning and effort is necessary in developing and maintaining a vocational education/defense sector alliance. Planning is the most important managerial function involved in the successful implementation of a training program. Joint program planning serves to:

* create a supportive climate;
* determine the specific needs of the defense firm or agency;
* develop program goals and objectives responsive to skilled and technical work force needs;
* identify and obtain the appropriate resources necessary for program implementation; and
* determine several procedures which will be employed throughout the operation of the program to include evaluation.

The planning process also provides vocational educators and defense personnel an opportunity to identify and resolve potential problems associated with program implementation. Each problem resolution will impact on the subsequent success of the program.

B. Developing Cooperation and Securing Support

Before proceeding with the steps in cooperative program planning and design, it is necessary to gain cooperation and support of those ultimately

responsible for the joint programs at the local and state levels. The following represents a suggested approach:

* Convening local and state meetings of vocational educators and defense representatives which could serve as the first step in conducting a needs assessment that would examine:

  (a) the extent of skill shortages within the defense industry and its impact on the ability of firms to meet defense work commitments;

  (b) the types of preemployment and employee training that are desired by defense firms and agencies;

  (c) how the vocational education delivery system works and what vocational education's capabilities are to respond to immediate and long-term skill needs; and,

  (d) examples of on-going and completed vocational programs serving the defense sector and the kinds of training facilities and expertise that can be made available to defense firms and military units such as the National Guard and Reserve.

* Follow-up meetings would focus on policy, leadership, planning, and implementing actions that would need to be addressed by vocational education and defense representatives.

* On-site visits for industry and education representatives to customized vocational education training programs and to defense related industries would be useful in acquainting these individuals with defense sector training needs and the kinds of services that vocational education can provide.

* State and local vocational education directors and staff and deans of occupational education will benefit by joining and participating in professional training and development associations. They will have an opportunity to gain a better understanding of industry's skill needs, how industry responds to these needs, and industry's perceptions of vocational education. This information can be used as a basis for cooperative planning on vocational education-defense joint projects.

C. <u>Utilizing A Defense Sector Advisory Group</u>

Forming a separate defense sector advisory committee to vocational education or a subgroup of an existing vocational education advisory committee will help develop a stronger vocational education and defense commitment to jointly deal with the skills training needs of local and state defense firms and agencies. This advisory group should focus on:

(1) ascertaining what kinds of unmet skill needs are likely to affect production adversely in firms doing defense work;

(2) assessing how well vocational education is responding to the skill needs of this segment of the local and state employment base; and

(3) suggesting how vocational education could be more responsive in addressing defense industry's skill needs.

The advice of employers in suggesting ways of improving vocational education programs has always been advocated by vocational education. Advisory groups are considered as essential to the attainment of quality programs and services and to program relevance in serving student and employer needs.

This suggested procedure is an extension of current practices by local and state education agencies and institutions. At the state level, for example, membership on the state advisory council on vocational education could be broadened to include representation from the state's defense community or a separate advisory committee could be appointed.

D. Cooperative Program Planning and Design

There is a general consensus that cooperative planning and design of joint training programs involving a vocational education/defense advisory committee would significantly contribute to the following basic planning activities:

* Conducting a Needs Assessment - Identifying current and projected occupational needs of the area defense sector is a vital part of program planning and design. A needs assessment consists of gathering information about a proposed training program by analyzing both the requirements of the potential clients of the defense firm or agency and the cost-effectiveness of the program.

  Conducting a needs assessment is not an end in itself, but an integral part of program planning. The information gathered can be used in planning relative to:

* objectives

* training outcomes

* marketing strategies

* utilization of industry's resources

* evaluation procedures

The needs assessment process enables defense personnel represented on an dvisory committee to directly participate in program planning. Further, the involvement of defense representatives in the planning process may be as important, if not more so, than the resulting plan in getting the kinds of interagency collaboration and coordination needed for an effective response.

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E. Preparation of Program Goals and Objectives - Once the needs assessment is completed, the advisory committee is in a position to assist vocational education staff in developing goals that should flow from a well defined statement of purpose which:

* identifies the clients to be served;

* identifies in general terms what will be done for clients;

* defines parameters for program activity;

* tells why the program came into being; and

* states these facts without reference to specific dates.

After the purpose statement has been formulated, goals, objectives, and desired outcomes for the program(s) dealing with the current and anticipated skill shortages and training needs of the area defense industry can be determined within designated times. Goals and objectives can be developed cooperatively with the assistance of a separate vocational education/defense advisory committee or a subgroup of the existing vocational education committee.

Goals and objectives can be determined by applying small group techniques in problem solving, using the results of the needs assessment as input to the group session. In finalizing a statement of goals and objectives for a joint training program, attention should be given to ensuring it: (1) is consistent and compatible with the philosophy of vocational education within an educational system and institution or a defense firm or agency, (2) is appropriate and realistic, and (3) provides a basis for determining impact through evaluation.

Goal statements should: (1) designate the general purpose or intent of the goal and what is to be accomplished, and (2) identify specific targets, time frame and results that can be measured to determine the extent to which they are achieved.

At the state level, it is suggested that the state plan for vocational education be used as one vehicle for indicating statewide and regional goals and objectives for reducing identified skill shortages in the defense community.

F. Identification of Available Resources - Once the training goals and objectives have been determined, the resources -- financial, personnel, facilities, materials and equipment -- needed to accomplish program outcomes should be identified. The primary question to be addressed in this step is, what does the program need? With respect to vocational educators and defense personnel, it will be necessary to clarify their roles, duties, and responsibilities.

G. Design of the Program - Program design involves identifying those activities required to achieve goals and objectives. This necessitates the development of administrative procedures that include:

* administrative approval and support as needed;

* identification of services to be provided by the defense firm/ agency;

* development of procedures for monitoring, evaluation and future needs assessments; and

* formulating a plan for disseminating information on the program.

In sum, these are the suggested steps in local vocational education-defense sector planning efforts. In each of these steps, defense representatives should be involved in varying degrees and levels. The degree of their participation in the planning process should be dictated by the specific role(s) and functions of vocational education.

As decisions are made to involve the defense establishment in various steps of planning, careful attention must be given not only to the role and function of vocational education, but also to the role and function of the individual, firm or agency representing the defense sector.

The state plan for vocational education can help further the collaborative process by:

* indicating if and how the state agency intends to give a priority to regular on-going instructional programs and to customized training programs that address defense industry skill needs when reviewing local program applications and funding programs, and

* serving as a vehicle to express the state board's commitment to an effective vocational education response to shortages of skilled defense employees and to the needs for upgrading the skills of workers in the defense industry.

H. Organizational Considerations in Fostering Collaborative Arrangements

Collaboration between vocational education and the defense community can be exchanged through an advisory committee structure. A strong advisory committee structure composed of trainers and management personnel from firms doing defense work and military representatives provides the appropriate organizational context in which defense and vocational education operators can reach a consensus on the important decisions for collaborative efforts to respond to the needs of defense firms and agencies in their area.

A vocational education/defense advisory committee can fulfill the following functions in working with vocational education staff:

1. Program development and review

* Provide input into basic decisions regarding the program;

* Review technical content of curricula;

* Share expertise of new and developing areas;

* Advise on administrative operations;

* Share information on new and developing occupations;

* Assist in surveys; and

* Assist vocational educators in establishing/revising the philosophy of vocational teacher education.

2. Program operation

* React to issues and concerns regarding program operation;

* Serve as or arrange for guest instructors;

* Advise on materials, facilities, and financing;

* Obtain instructional supplies and equipment;

* Aid in maintaining a current system or institutional library of visual aids, magazines, and books;

* React to concepts, practices and policies regarding collaborative arrangements;

* Identify potential stations for cooperative work experience;

* Evaluate facilities, equipment, and student work and recommend equipment and space needed, particularly in new training programs;

* Aid in occupational analysis for use in internships;

* Assist in developing program/course objectives;

* Inform vocational education departments on changes in the labor market including interpretation of local surveys of defense employer human resource needs, anticipated employment, etc.;

* Assist in making cost studies for specialized programs/courses;

* Evaluate the program and make recommendations for improvement;

* Arrange for plant and installation visits and other field trips;

* Improve communication between the vocational education program staff, students, and defense personnel;

* Help with work experience placement.

3. Instructor in-service

* Provide opportunities for upgrading instructors' technical skills and knowledge through work experience;

* Develop a personnel exchange program for vocational education faculty and defense representatives;

* Arrange for in-service meetings, clinics and/or workshops;

* Obtain subscriptions to defense related magazines and other publications;

* Help facilitate membership for instructors in professional training and development associations; and

* Help with work experience placement.

4. Assist in public relations

* Serve as a resource for speakers about vocational education/defense collaboration;

* Provide news releases to defense and vocational education related publications; and

* Assist in providing news releases to the public media about vocational education/defense collaborative activities.

A local vocational education/defense advisory committee can be utilized most effectively when it functions with (a) a clear statement of purpose, (b) the work expected, and (c) an understanding of the limits or extent of its authority. The roles, duties and responsibilities of an advisory group should focus on involvement in the policies, purposes, goals, objectives and criteria associated with the collaborative process.

An industry-education council (IEC) type advisory group also can be an appropriate structure in fostering exemplary linkages between vocational education and the defense establishment. The purpose of an IEC is to further school improvement and economic development in a labor market area.

This umbrella type organization focuses on channeling industry's volunteer resources in a coherent manner into the total public school and postsecondary program to help refocus/redirect/reshape academic and vocational education so that it is more responsive to both student and employer needs. It is composed of the power structure -- the clout -- of the business, education, labor, government, professional community and emphasizes improving the education-to-work process and the capability of an educational system or institution to respond to employer training needs.

An IEC provides the appropriate broad based structure designed to strengthen existing local advisory groups to education such as a vocational education advisory committee and improve the coordination among all local advisory groups interacting with public and postsecondary education. Therefore, increasing and broadening the linkage between vocational education and the defense industry would be central to an IEC's mission which is directed at school improvement and economic development; the latter including the development of responsive training programs to meet current and anticipated skilled and technical short and long term work force needs of area employers.

Industry-education councils are operational throughout the nation in such states as New York, California, Virginia, Arizona, Colorado, Alabama, Georgia and Wisconsin. The National Association for Industry-Education Cooperation promotes IECs and provides technical assistance to communities to establish or strengthen this type of systemwide advisory organization.

At the state level, the following organizational collaborative arrangements are suggested in developing and/or expanding vocational education/defense linkages:

* Trainers and management personnel doing defense work should be encouraged to serve by a governor's appointment on a state advisory council on vocational education, including the state plan group and other state vocational education advisory committees.

* State vocational education staff should be encouraged to take the leadership role in promoting collaborative efforts among state agencies in order to come up with a procedural plan for coordinating state-level efforts to serve the training needs of defense firms and agencies.

* A particular unit or individual could be assigned the leadership responsibility for promoting, planning, and taking part in state-level interagency, state-local vocational education, and vocational education-defense sector collaborative arrangements. Sufficient resources would need to be allocated to ensure an effective job.

VIII. IMPLEMENTATION PROCESSES AND TECHNIQUES

A. Approaches to Implementation

Implementing effective linkages between the vocational and defense communities is a continuing process which includes:

(1) translating goals into measurable objectives;

(2) establishing priorities;

(3) identifying what must be done to get desired results;

(4) allocating human and material resources;

(5) specifying when each activity must occur; and

(6) evaluating progress at scheduled check points.

B. Implementing and Strengthening Vocational Education/Defense Joint Efforts

The previously discussed planning and organizing strategies are directed at furthering the implementation of the categories of collaborative projects described in Section III. There are additional strategies in implementing these categories of projects along with other areas of opportunity, facilitated by a local advisory mechanism as follows:

1. A determination should be made as to which vocational education agencies and institutions can offer customized training to defense industries and agencies and what technical and financial assistance will be needed from the state agency in order to initiate or maintain a quality response.

2. Defense sector sponsored workshops for local and state vocational education personnel will help in developing their skills in how best to sell their training services and implementing and managing customized training programs for industrial clients engaged in defense work. The workshops would focus on areas such as entering into contracting and using performance, management, and assessment techniques. By implementing this procedure, vocational educators would be better prepared to conduct business arrangements with defense firms and agencies.

3. The defense sector should provide technical assistance (e.g., curricula, in-service administrator or teacher training) to local vocational education agencies and institutions, as necessary, to enable them to respond to defense industrial base and agency training needs.

4. Joint vocational education/defense sponsored technical assistance directed at small and medium-size firms should be designed to help these companies get defense work by familiarizing them with government contracting procedures and proposal writing techniques and the services provided to these businesses by vocational education agencies and institutions. This proposed activity involves vocational educators in a job creation activity that is likely to be followed by a training role for vocational education.

5. Vocational education needs to promote more aggressively its customized training programs to defense firms and agencies by publicizing its (a) willingness to compete with other vendors, and (b) its ability to do training in a cost-effective and timely manner. This suggestion is intended to convince employer skeptics that it is good to do business with vocational education agencies and institutions, especially for firms that need a quick response to meet training needs required by defense contracting.

6. The state vocational education agency should establish an information and dissemination capability to identify new defense work coming into the state (assuming this information can be obtained from the U.S. Department of Defense, the State's Department of Commerce, or from some other state agency) and describe on-going and completed vocational education efforts in support of such work. This information would be disseminated to local vocational education agencies and institutions, selected firms, industry associations, and the media across the state.

7. There is a need for vocational education to develop an early warning system to identify skill needs by using procedures such as (a) organizing a vocational education/industry task force to survey their training and management peers in other firms periodically to find out what kinds of emerging occupations, changing production technologies, skill shortages, and training needs are likely to occur in their particular industry, and requesting the task force to draw up some conclusions about what vocational education might do to respond; and (b) arrange to work directly with firms that expect to be or have been awarded a large, multiyear defense contract in order to understand and anticipate what kinds of, and how many, skilled workers will be needed at what points in the life of these contracts.

C. <u>Recognition of Service</u>

Initiating an effective vocational education-defense sector collaborative effort can mark the beginning of a long and beneficial relationship for both parties involved, or it can represent the start of a short and unproductive experience as a partnership. An on-going effort in

communication and follow-up to reenforce the cooperative arrangement and recognize the contributions of individuals or organizations is a priority in establishing and maintaining an exemplary vocational education/defense alliance.

Some informal methods that can be used by both vocational education and defense personnel are:

* Requesting advice on problems;
* Expanding individuals' responsibilities in the partnership commensurate with their capabilities and interests;
* Sharing items of interest in various publications;
* Providing invitations to attend staff meetings; and,
* Alerting the other sector to upcoming activities which may be of interest.

Examples of formal recognition for vocational education/defense collaborative projects are:

* Awarding special citations for outstanding achievements;
* Scheduling community-wide recognition events;
* Publishing a "recognition" edition of newsletters;
* Conducting an annual awards program;
* Awarding plaques to co-sponsoring groups.

IX. A COMPREHENSIVE EVALUATION SYSTEM

Collaboration between vocational education and the defense establishment must include a comprehensive evaluation system. The concept of accountability is inherent in evaluation, and industry involvement is fundamental to accountability.

Evaluation may be viewed as a process that supports decision-making. Program evaluations, therefore, should be designed to provide information on which to base decisions concerning joint program operations and to demonstrate the impact of the program.

The evaluation process is a component of the management system with the underlying purpose of improving program performance. Vocational educators and defense representatives must constantly seek feedback concerning the effectiveness of what they are doing in their joint efforts. This type of monitoring provides information to decision-makers at all levels.

Evaluation must be viewed as a dynamic activity. Program objectives need to be reviewed and updated periodically, as well as the tests and procedures used to measure them. Criteria must be re-examined and re-evaluated over time, as more data are accumulated. Defense representatives can contribute to a sound evaluation system through the previously discussed advisory committee organization. Their background in management information systems and managing by objectives can be particularly effective in planning the evaluation by:

* specifying what is to be evaluated;

* designing the evaluation plan;

* implementing the plan; and

* reporting the findings.

Thus, a vocational education/defense collaborative effort in developing a comprehensive evaluation system will provide information to answer questions such as:

* How is the program progressing?

* Is everyone meeting the expectations of the program?

* Is the particular program the most tailored, cost-effective activity or would another do a better job?

* Did the program accomplish what the planners said it would accomplish?

It is appropriate to involve defense representatives in the evaluation process as often and in as many ways as possible. Success requires commitment and commitment demands ownership. Prerequisites to ownership are

thorough, first-hand involvement as well as a self-perceived ability for significant contribution.

In enlisting the participation of defense personnel in developing a sound evaluation system, the challenge for vocational education directors is to devise the means by which defense representatives can be used effectively. This effort will go far toward assuring that evaluation and accountability are an integral part of the cqllaborative process and that the defense community assumes its proper role in that process.

X. SUMMARY

Central to the success of fostering collaboration between vocational education and the defense establishment are:

a. Clear recognition that providing training services to employers is actually serving individuals (their clients) and thereby fulfilling the mission of vocational education.

b. Recognition on the part of state legislatures and governors that vocational education has a definite role to play in economic development, which in turn can contribute to defense preparedness. This recognition should be supported by funds specifically earmarked for such purposes so that the more traditional programs of vocational education would not suffer financially by increased efforts devoted to industry-education collaboration.

c. Special emphasis on determining the common needs of business and vocational education.

d. Openness of communication and serious attempt to understand each other's position.

e. Realistic commitments made by vocational education to employers.

f. A marketing plan developed and updated periodically.

g. Staff members actually engaged in promotion and sales.

h. Recognition of the differences between the business environment and education:

   * importance of deadlines and

   * need for flexibility.

By allowing the defense community to participate in the program planning, implementation, and evaluation process, vocational education can demonstrate its willingness to respond more effectively to defense work force training needs and to be accountable for the results produced. An advisory group type of organization provides the catalyst for effective vocational education/defense establishment linkages. As these guidelines have detailed, the potential for coherent, cost-effective, long term linkages is there. Yet, the problem is that it has always been there.

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